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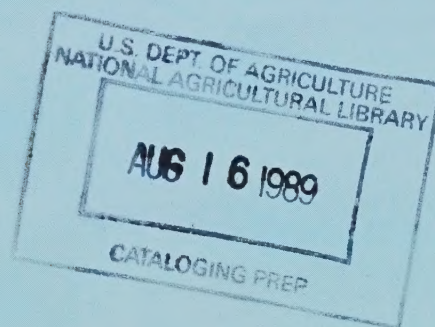
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INSIDE

NATIONAL  
VETERINARY SERVICES  
LABORATORIES





# HISTORY

**A**lthough one can trace the roots of the NVSL into the old Bureau of Animal Industry, probably the most significant event related to our beginning was the opening of the National Animal Disease Laboratory (NADL) at Ames, Iowa, in 1961. The original organizational structure of the NADL provided for a Director, an Assistant Director for Research, and an Assistant Director for Regulatory Laboratories. The Regulatory Laboratories were assigned 20 percent of the NADL space and were to provide diagnostic services for the Animal Disease Eradication Division and biologics evaluations for the Animal Inspection and Quarantine Division. The Assistant Director for the Regulatory Laboratories was Dr. C. D. Van Houweling.

Within a few years, reorganization resulted in three rather independent units for research, biologics, and diagnostics; and growth necessitated the location of facilities outside the NADL for the biologics group. In 1971, Animal Health Division (AHD) laboratory facilities at Beltsville, Maryland, were assigned to the Diagnostic Services group.

Another reorganization in 1973 resulted in the Biologics Laboratory and the Diagnostic Services Laboratory being brought back together under one Director and being named Veterinary Services Laboratories. Dr. M. T. Goff was named the first Director. In December 1977, the name was changed to National Veterinary Services Laboratories. Growth continued, and plans were made for construction of new facilities. Phase I of the plans was completed in 1978, and the biologics portion of the NVSL, along with the administrative and support functions, moved into the new building at 1800 Dayton Avenue. In the same year, Animal and Plant Health Inspection Service, formerly AHD, facilities in Beltsville, Maryland, were closed, and the functions moved to Ames.

In 1984, diagnostic activities at the Plum Island Animal Disease Center, Plum Island, New York, were transferred to APHIS' supervision, given the name Foreign Animal Disease Diagnostic Laboratory, and made a part of the NVSL.



# OUR MISSION

The mission of the National Veterinary Services Laboratories (NVSL) is to provide support for the animal health programs of the Animal and Plant Health Inspection Service (APHIS), United States Department of Agriculture. The animal health programs are designed to protect the health of the nation's livestock and poultry and are administered in cooperation with state and foreign governments. Support services provided by the NVSL include a wide array of diagnostic procedures involving pathology, bacteriology, virology, serology, immunology, parasitology, toxicology, chemistry, and a monitoring program to assure the quality and safety of biologics offered for sale to the livestock and poultry interests. The laboratories have a vital role in monitoring animals and birds offered for importation for disease agents which are exotic to the United States.

Accomplishing the mission requires an aggressive effort to maintain competence through developmental projects and formal and informal training programs. Knowledge and skills are made available to others through publications in scientific journals and texts, lectures, demonstrations, schools, bench training, and personal consultation.

**Plum Island**



**NVSL Central**



# RECOGNITION

**A**lthough the NVSL as a unit has a relatively short history, it has a sound heritage on which it has continued to build; and it has attained considerable stature.

Nationally, it is recognized as a reference center for diagnostic veterinary medicine and for evaluation of veterinary biological products. Areas of special recognition include toxicology, salmonellosis, leptospirosis, avian influenza, Newcastle disease, brucellosis, bovine tuberculosis, babesiosis, and all foreign animal diseases.

Regionally, the Food and Agriculture Organization (FAO) recognizes the NVSL as the reference center in North America for hog cholera and in the Western Hemisphere for velogenic viscerotropic Newcastle disease, avian influenza (fowl plague), contagious bovine pleuropneumonia, contagious caprine pleuropneumonia, Ibaraki, malignant catarrhal fever, African horse sickness, bovine ephemeral fever, sheep and goat pox, contagious agalactia, bluetongue, and rinderpest.

Internationally, the FAO recognizes the NVSL as the reference center for African swine fever, and the World Health Organization recognizes it as the reference center for *Brucella abortus* strain 1119-3 "original seed" for use in antigen production.







## PATHOBIOLOGY LABORATORY

Providing a full range of pathology, including clinical pathology, parasitology, toxicology, and chemistry services, the Pathobiology Laboratory is the APHIS laboratory that conducts gross and histopathological examinations for tuberculosis, scrapie, velogenic viscerotropic Newcastle disease, Venezuelan equine encephalomyelitis, hog cholera, and other program diseases. It is also the APHIS reference center for the taxonomic classification of ticks, scabies mites, and screwworms and is the reference center for veterinary analytical toxicology.

The Laboratory also performs comprehensive differential diagnostic studies and field investigations of exotic and enzootic animal disease outbreaks, provides technical support to the Veterinary Biologics program, provides diagnostic consultation and on-site field trips, and conducts APHIS-sponsored training courses for domestic and international visitors.

In addition, tests to detect fraudulent blood samples are conducted, chemical analyses of veterinary vaccines and foreign food products are done, and quantitative analyses of insecticides and disinfectants are performed. APHIS employee cholinesterase levels are monitored as part of the APHIS Safety and Health Program, and new or improved testing procedures are researched.

## FOREIGN ANIMAL DISEASE DIAGNOSTIC LABORATORY

The Foreign Animal Disease Diagnostic Laboratory is a high-level biocontainment laboratory with multidisciplinary expertise having the capability of diagnosing approximately 40 animal diseases foreign to the United States. It is the designated reference laboratory for 11 diseases.

The Diagnostic Services and Scientific Services sections provide Veterinary Services, APHIS, USDA, and many foreign countries laboratory confirmation of an exotic animal disease diagnosis. Diagnostic Services also tests cell lines, hybridomas, viruses, vaccines, and specimens from animals to be imported into the United States for freedom of animal disease agents foreign to the United States. Both Sections develop and test diagnostic protocols.

The Reagent and Vaccine Services section develops diagnostic procedures, prepares reagents, develops and tests vaccine seed lots for exotic diseases, and maintains a foreign animal disease agent repository. Reagents are provided to many countries. As the custodian of the North American FMD antigen bank, this Section monitors the antigen for purity, potency, and innocuity as required.

The Laboratory has a Cobalt 60 gamma irradiation source for treatment of certain biological specimens being imported into the United States.

## BIOLOGICS VIROLOGY LABORATORY

The Biologics Virology Laboratory tests veterinary biological products used in the diagnosis, prevention, and treatment of viral animal diseases. Primary activities include: 1) quality control monitoring of licensed products; 2) testing of new products prior to licensure; 3) reference and reagent production, evaluation, and distribution; and 4) developmental activity.

Samples of all serials of licensed veterinary biologicals are submitted to the NVSL by the manufacturer and stored for the dating period or shelf-life of the product. All serials are tested by the manufacturer, and the reliability of the manufacturer's quality control program is monitored at the NVSL by testing randomly selected serials. The rate of testing is influenced by past performance so resources are efficiently directed to assure that only pure, safe, potent, and effective biologics are marketed. The Laboratory is also responsible for certification of cell lines to be used in the production of viral vaccines, diagnostic antigens, and monoclonal antibodies for diagnostic or therapeutic use. The "Master Seed Virus" for a new product is extensively tested for purity and identity, and the initial serials of new products are evaluated with the same tests as later, randomly selected serials would be.

Rapid advances in virology and immunology require a continuous effort to develop innovative, state-of-the-art, standardized assay techniques. Developmental studies within the Laboratory address these issues and will reduce animal evaluations of biological products.

## BIOLOGICS BACTERIOLOGY LABORATORY

The Biologics Bacteriology Laboratory monitors biologicals of bacterial origin for purity, potency, safety, and efficacy. The Laboratory also tests viral origin biologicals for viable bacterial, fungal, and mycoplasmal contamination. References and reagents that are necessary for the testing of the bacterial biologicals are produced and distributed to licensees for their use. USDA standards of potency for bacterial products are developed using diverse bacteriological, immunological, and molecular techniques. The Laboratory assists the Veterinary Biologics Staff by conducting tests that confirm experimental data submitted by licensees in support of requests to license new biological products.

Developmental projects are designed to improve current standard requirements; to devise new test methods which utilize faster, more efficient, more economical, and more humane ways of evaluating biologicals; and to gain expertise and experience with new advances in technology. The technical expertise in biotechnology and the utilization of advanced scientific instrumentation are necessary to maintain the Laboratory as a leader in biological methods development. They also ensure that the newer biological products can be evaluated properly.

## DIAGNOSTIC BACTERIOLOGY LABORATORY

The Diagnostic Bacteriology Laboratory provides diagnostic assistance to the livestock industries of the United States. The major functions include serologic testing for the presence of antibodies to numerous bacterial and protozoan pathogens and the isolation and identification of bacteria. Support is provided for the national tuberculosis and brucellosis eradication campaigns through the isolation and identification of *Mycobacteria* spp. and *Brucella* spp. and serologic testing.

The Laboratory is the National Reference Center for Leptospirosis and the reference center for serotyping *Salmonella* and *Escherichia coli* from animal sources. Import and export tests are performed for exotic diseases of horses such as piroplasmiasis, dourine, glanders, and contagious equine metritis. Tests for babesiosis of cattle are also performed. Animals for export are tested for anaplasmosis, brucellosis, leptospirosis, paratuberculosis, and salmonellosis. Check tests are offered for standardization of anaplasmosis, leptospirosis, and mycoplasmosis testing; and reagents are furnished for paratuberculosis testing in other laboratories.

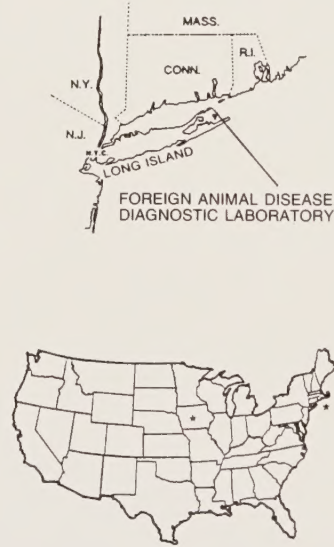
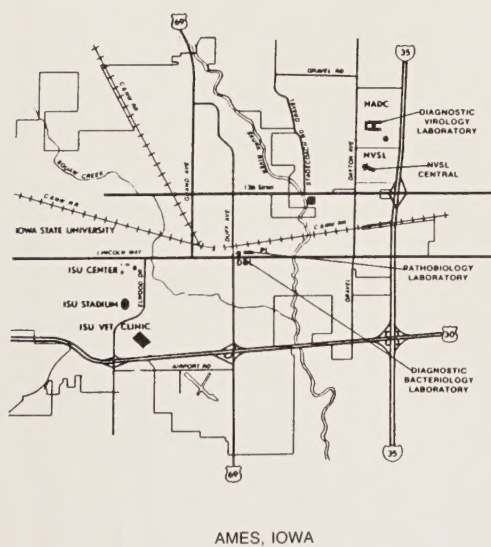
Laboratory personnel have expertise in immunology and serology, isolation and identification of bacterial pathogens of domestic animals, standardization of diagnostic testing, production of reagents for diagnostic testing, and use of computers in diagnostic laboratories.

# THE LABORATORIES

Seven laboratories, a Program and Administrative Services section, and an Engineering and Facilities Management section constitute the NVSL.

The major facility located at 1800 Dayton Avenue, Ames, Iowa, houses the Biologics Bacteriology Laboratory, the Biologics Virology Laboratory, the Scientific Services Laboratory, the Engineering and Facilities Management section, and the Pro-

gram and Administrative Services section. The Diagnostic Bacteriology Laboratory, the Diagnostic Virology Laboratory, and the Pathobiology Laboratory are located at three satellite locations in Ames; and the Foreign Animal Disease Diagnostic Laboratory is located off the eastern tip of Long Island, New York, as shown on the maps below. Future plans include construction of additional facilities to house all of the Ames laboratories at the Dayton Avenue site.



## DIAGNOSTIC VIROLOGY LABORATORY

The Diagnostic Virology Laboratory provides diagnostic assistance by isolating and identifying viruses and by detecting serum antibodies resulting from viral infection. The work is performed with urgency since the viruses of major interest to APHIS cause serious animal and avian plagues such as hog cholera, velogenic viscerotropic Newcastle disease, equine encephalomyelitis, bluetongue, avian influenza, and vesicular disease.

Due to the serious diseases caused by these viruses, the work is performed under high security, maintained by autoclaving or fumigating materials leaving the Laboratory and 100 percent air-exhaust through high-efficiency biological filters. In addition, a complete clothing change and showering is required for Laboratory personnel and visitors prior to leaving the facility.

The Laboratory provides support for the pseudorabies control program and provides diagnostic assistance to other laboratories. It is responsible for standardization of pseudorabies, bluetongue, equine infectious anemia, bovine leukosis, and equine viral arteritis serologic testing. In addition, personnel prepare a large number of reagents for distribution to other laboratories, assist in APHIS training courses, and develop new techniques for the diagnosis of viral diseases.

## SCIENTIFIC SERVICES LABORATORY

The Scientific Services Laboratory provides scientific and technical support to animal health programs, the biologics industry, and the biologics and diagnostic activities of the NVSL. Personnel have expertise in such diverse areas as laboratory animal medicine, animal facility design and management, biocontainment of infectious and ectoparasitic agents, handling and shipping of hazardous materials, computer software design, data communications, and statistical design/analysis.

The Technical Support section supplies media, chemical solutions, and laboratory glassware. The Animal Resources section provides animal tissues, specific-pathogen-free and conventional animals, and animal care. The Biometrics and Data Systems section develops a uniform laboratory report

and data system and furnishes technical advice on sampling procedures, experimental and survey designs, and the interpretation and validation of results. The Biological Materials Processing section receives and distributes biological samples and diagnostic specimens. It also ships reagents and supplies for use in animal health programs.



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